International Journal of Health Sciences and Research
www.ijhsr.org ISSN: 2249-9571

Original Research Article

To Assess the Effect of Maternal Mental Health on Engagement in Health Practices during Pregnancy in Selected Hospital at Mangaluru

Shiji Jacob[1], Ms Darryl Monica SerafineAranha[2], Mrs. Pramila D'souza[3]

[1]M.Sc. Nursing student in Obstetrics and Gynecology, Father Muller College of Nursing, Mangaluru.
[2]Associate Professor, [3]Assistant Professor,
Department of Obstetrics and Gynaecological Nursing, Father Muller College of Nursing, Mangaluru.

Corresponding Author: Shiji Jacob

ABSTRACT

Background: Pregnancy is often considered the golden period in a woman's life. There are physical as well as mental challenges faced by them during this period. While apparent physical problems are often addressed but the challenges related to mental health often go undiagnosed. The aim of the present study is to assess the effects of maternal mental health on engagement in health practices during pregnancy.
Method: A quantitative approach was used to assess the effect of maternal mental health on engagement in health practices during pregnancy among women who met the inclusion criteria. 380 participants were selected by using purposive sampling. Edinburgh Postnatal Depression Scale and structured health practice questionnaire were the tools used. Data were analyzed using descriptive and inferential statistics.
Results: The findings of the study revealed that 59.5 % of women showed possible depressive symptoms but the majority of participants (98.9 %) engaged in good health practices. There was no correlation between maternal mental health and engagement in health practices among the participants. It was found that mental health status had a significant association with religion and at the same time, religion and education significantly influenced health practices.
Conclusion: Though the majority of the participants showed possible depressive symptoms, there is good engagement in health practices. Leaflets were prepared which can improve the maternal mental health.

Keywords: Engagement in health practice, maternal mental health, Pregnancy, effects.

INTRODUCTION

Pregnancy intensifies the concept of beauty. During this period the woman experience's immense joy coupled with excitement. The feeling of carrying a little soul within a woman is magnificent. [1] Pregnancy is a time of many changes. The body, emotions and the life of her family are changing. She may feel uncomfortable with these changes sometimes, but they can add new stresses to her life. Feeling stressed is natural during pregnancy. But too much stress can make her uncomfortable. [2] According to The American Congress of Obstetricians and Gynaecologists (ACOG), between 14-23% of women will tussle with some signs of depression during pregnancy. [3]

In the recent decade, there have been an increasing number of studies on antenatal mental health in developing countries. A Brazilian cross-sectional study (n=432)

reported the prevalence of state and trait antenatal anxiety (AA) to be 59.5% and (AD) 45.3%, respectively. In a study from Pakistan, 42.7% of the women (n=213) had antenatal depression, assessed on EPDS. Among Bangladeshi women (n=361), the prevalence of antenatal depression assessed on EPDS was 33%. Thus, studies from developing countries indicate that the prevalence of antenatal distress is higher compared with those from developed countries. [4]

Antenatal women's health practices are associated with maternal and neonatal outcomes. A study conducted among 166 African American antenatal women in 2016 examined the role of mental health and health practices during pregnancy. It also revealed that 59 % of the women experienced depressive symptomatology during pregnancy. Participant scores on the HPQ-II and EPDS were strongly negatively correlated ($r = -0.80$; $P < .001$) suggesting that those participants with higher depressive symptomatology reported less engagement in favorable health practices. [5]

Antenatal depression is one of the most common health problems during pregnancy. Worldwide, between 9% and 24%women experience a depressive disorder while pregnant. Based on a systematic review including more than 19 000 pregnant women, the prevalence of depression was 7.4%, 12.8% and 12.0% for each trimester, respectively. A recent review of 86 studies in Asia found that the overall prevalence of antenatal depression was about 20%. In addition to struggling with depressive symptoms, women tend to have poor prenatal care, increased incidence of obstetric complications, premature delivery, and postnatal depression. [6]

A cross-sectional study was conducted among 318 women from November 2013 to May 2014 in an outpatient Department of Obstetrics of a Tertiary Care Hospital, Bengaluru with an aim to assess the prevalence of antenatal depression and detect the risk factors for early diagnosis and intervention. The study result revealed that most of the women (69.8%) in the current study were in the age group of 18-24 years, which is in keeping with the sociocultural aspect of early marriage and giving birth in the Indian society. Majority of the women were educated for more than 8 years of whom 11% (n=32) had scores of ≥10 indicating possible depression on EPDS score ($P<0.01$). [7]

A descriptive study was conducted among 100 antenatal mothers in a selected hospital in Mangalore in 2014 to assess the level of anxiety and depression among antenatal mothers in a selected hospital, Mangalore. The result indicated that 8% of the subjects had a severe level of anxiety, 22% had moderate and 70% had a mild level of anxiety, whereas 3% subjects had severe depression, 19% had moderate depression and 78% had a mild level of depression. The mean anxiety score was 12.91; with an SD of 7.018, and the mean% were 23.05. The mean depression score was 8.06, with an SD of 2.339 and the mean% was 26.87. The study concluded that anxiety and depression during pregnancy are the major health problem among reproductive-aged women. [8]

Various studies have proved that there is a certain level of depression, in the pregnant women and it affects the health practices of women during pregnancy. In the current study, the investigator is interested to screen the antenatal women who are in the third trimester to assess the status of the maternal mental health in pregnancy and to examine antenatal women's various health practices that they are engaged in during pregnancy.

Objectives of the study:

1. To determine the maternal mental health status of antenatal women in the third trimester
2. To assess the level of engagement of health practices of antenatal women in the third trimester.
3. To find the relationship between maternal mental health and engagement in health practices among antenatal women

4. To find the association of maternal mental health with selected baseline variables
5. To find the association of health practices of antenatal women with selected baseline variables.

The study assumes that good maternal mental health status will promote good antenatal practices, during pregnancy antenatal women may experience some stress and anxiety leading to depression, maternal mental health may affect either positively or negatively on engagement in health practices during pregnancy and negative mental health may affect the health of the mother and the fetus.

MATERIALS AND METHODS

Study design: A descriptive correlation study was conducted in the Father Muller Medical College Hospital at Mangaluru. It is a tertiary, multi-specialty hospital with 1250 beds. The hospital has a well-equipped obstetrical and gynaecological outpatient department, wards and labor room. Around 3500-3750 women visit the OPD every month and among them around 1750 are antenatal women. The present study was conducted in the outpatient department and antenatal wards of the hospital. The ethical clearance was obtained from Father Muller Institutional Ethics Committee prior to the study; informed consent was taken from participants for taking part in the assessment. A total of 380 participants who fulfilled the inclusion criteria were enrolled for the study. The participants for the study were selected using Purposive Sampling Technique. The reliability of the translated tools – Edinburgh Postnatal Depression Scale and Structured Health Practices Questionnaire was done using Cronbach Alpha. Edinburgh Postnatal Depression scale was 0.98 and Structured Health Practice Questionnaire was 0.92 which indicated that the tool was reliable

The study tools were first Baseline proforma which consisted of ten items of baseline variables such as mother's age, religion, education, marital status, employment status, family monthly income, obstetrical score, type of family, the area of living, and living with spouse or not. Second Edinburgh Postnatal Depression Scale which contains 10 items and focuses less on somatic symptoms associated with depression making it particularly valuable during the perinatal period. [9] Women are asked to rate their responses in a Likert-type format and represent how they've felt over the past 7 days. Each item is scored 0 to 3 and the total scale score ranges from 0 to 30 with higher scores indicative of higher depressive symptomatology. The EPDS questions 1, 2, & 4 (without a*) are scored 0, 1, 2 or 3 with top box scored as 0 and the bottom box scored as 3. Questions 3, 5-10 (marked with a*) are reverse scored, with the top box scored as a 3 and the bottom box scored as 0.Third Structured Health Practice Questionnaire which contains 34 items that ask about health practices in six domains including rest and exercise, safety measures, nutrition and supplements, substance use, healthcare access, access to pregnancy-related information. [10] Responses range from 1 (never) to 5 (always or daily). The total score ranges from 34 to 170 with a higher score is indicative of a greater engagement in health practices.

Data collection: The data collection was scheduled from 26th February to 24th March 2018. The researcher obtained formal written permission from the administrator of the Father Muller Medical College Hospital prior to data collection. The investigator introduced herself to the subject and explained the purpose of the study to the selected antenatal women. Confidentiality was assured and written consent was obtained from the antenatal women. The Baseline Proforma, Edinburgh Postnatal Depression Scale, and Structured Health Practices Questionnaire were administered to the selected antenatal women. The investigator checked for its completion. The average time taken to complete the tools was 30 minutes. A total of 380 participants completed the questionnaire. The collected data was compiled for analysis.

Data analysis: The data obtained was entered into the master sheet and analyzed on the basis of objectives. Baseline variables were analyzed by using frequency and percentage. Data were analyzed using SPSS 24 version (SPSS: An IBM Company).There were no missing data. Descriptive and inferential statistics (chi-square, Karl Pearson correlation) was used for the data analysis.

RESULTS

Demographic variables:

Table 1: Frequency and percentage distribution of participants according to their baseline variables n = 380

Variable	Frequency (f)	Percentage (%)
Age in years (Mean age 26.37 ± 4.20)		
≤ 20	24	6.3
21-25	151	39.7
26-30	142	37.4
31-35	52	13.7
≥36	11	2.9
Religion		
Hindu	69	18.2
Muslim	266	70.0
Christian	45	11.8
Education		
Higher primary	75	19.7
High school	142	37.4
Higher secondary	81	21.3
Degree	56	14.7
Post graduate	26	6.8
Marital Status		
Married	380	100
Employment Status		
Home maker	333	87.4
Employed	47	12.6
Monthly family income in rupees		
Mean income (17505.5 ± 38587.63)		
Below 5000	17	4.5
5000-10,000	174	45.8
10,001-20,000	21	38.9
20,001-30,000	21	5.5
30,001 and above	20	5.3
Obstetrical Score		
PrimiGravida	175	46.1
Multi Para	205	53.9
Type of family		
Nuclear family	85	22.4
Joint family	295	77.6
Area of living		
Urban	190	50
Rural	190	50
Participants lived with spouse		
Yes	334	87.9
No	46	12.1
If no, whom do you live with?(n=46)		
With family members	46	100

The data in table 1 revealed that majority (77.1%) of the participants was young mothers belonging to the age group of 21 to 30 years and very few (2.9%) were above 36 years. The mean age was 26.37 ± 4.20.Majority (70%) of participants were Muslims and rests of the participants were Hindus (18.2%) and Christians (11.8%).Very few (6.8%) were professionals. Most (37.4%) were high school literates. The data revealed that majority (87.4%) of the participants were homemakers and the rest (12.6%) were employed.

Almost less than half of the participants (45.8%) earned between Rs 5000-10,000, 38.9% of participants earned Rs.10, 001 -20,000 and only few (4.5%) had an earning less than Rs.5000 Among the participants 53.9% were multi para and 46.1% were primigravida. Majority (77.6 %) of participants belonged to joint family and the rest belonged to nuclear family (22.4%).The participants were equally (50%) distributed to the urban and rural areas. Majority (87.9%) of participants lived with their spouse and among those (12.1%) who were not living with spouse, 100% lived with their in-laws as their spouse was working elsewhere.

Section II: Assessment of maternal mental health status of antenatal women

This section, deals with the assessment of maternal mental health status as per level of depressive symptomatology. It is elicited in terms of level of depressive symptoms by using Edinburgh Postnatal Depression Scale

Levels of depressive symptomatology among the participants n=380

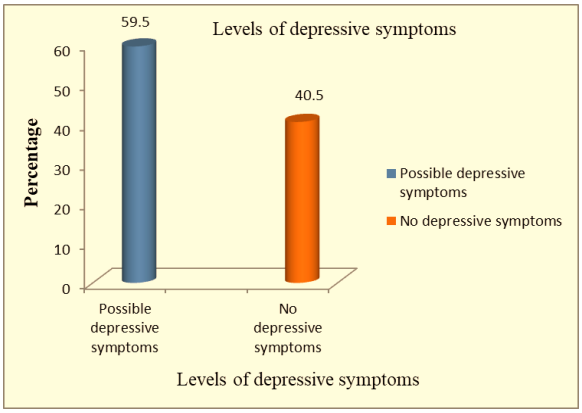

Figure1: Cylinder diagram showing the levels of depressive symptoms among participants

The data presented in figure 1 reveals that 59.5 % of women showed possible depressive symptoms, and 40.5% had no depressive symptoms.

Section 3: Assessment of health practices of antenatal women

Figure 2: Pyramid showing the levels of engagement in health practice of participants

The level of engagement in health practices are arbitrary graded as good health practices and poor health practices n=380

Data from figure 2 revealed that majority of participants (98.9 %) engaged engagement in good health practices and only 1.1% of participants engaged in poor health practices n=380

Figure 3 revealed that the participants 92.2% refrained from substance abuse. 79.8% accessed health care. 76.9% practiced intake of good nutrition and supplements, 68.8% balanced rest and exercise and 61.1 sought health information whenever necessary. The practices of safety measures were found to be satisfactory.

Overall, it was found that refraining from substance abuse, proper nutrition, practice of rest & sleep and health care access were found favourable.

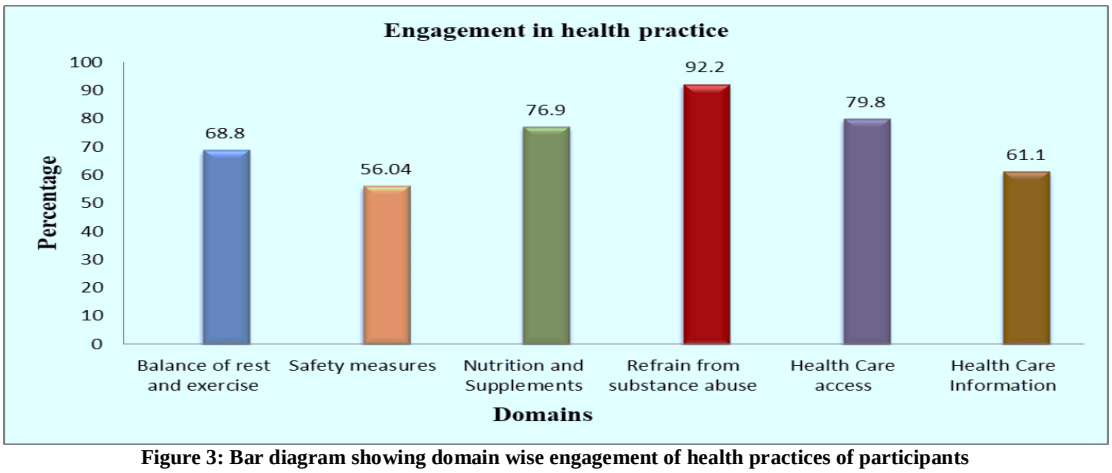

Figure 3: Bar diagram showing domain wise engagement of health practices of participants

Section 4: Relationship between maternal mental health status and engagement in health practices

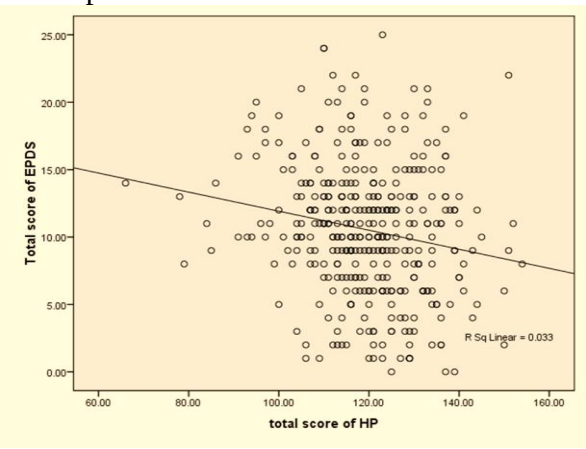

Figure 4: Scatter diagram showing relationship between mental health and engagement in health practices

Figure 4 revealed that there is no correlation between maternal mental health and engagement in health practices among antenatal women. Higher scores on the HPQ indicative of engagement in more good health practices. Higher scores on the EPDS indicative of greater possible depressive symptomatology.

Section 5: Association between maternal mental health status of the antenatal women and selected baseline variable

Table 2: Association between the maternal mental health status of the antenatal women and selected baseline variable n=380

Variables	Median <10 ≥ 10		χ^2 Value	P value
Age				
≤ 20	9	15		
21-25	76	75		
26-30	77	65	6.098	.192
31-35	20	32		
Above 36	7	4		
Religion				
Hindu	30	39		
Muslim	129	137	6.404	.041*
Christian	30	15		
Education				
Higher primary	37	38		
High school	64	78	4.521	. 340
Higher secondary	44	37		
Degree	27	29		
Post graduate	17	9		
Employment status				
Home maker	165	168	.038	.846
Employed	24	23		
Income				
Below 5000	12	5		
5000-10,000	79	95	5.404	.248
10001-20,000	78	70		
20001-30,000	9	12		
30,001& above	11	9		
Obstetrical score				
Primigravida	85	90	.176	.675
Multi para	104	101		
Type of family				
Nuclear	44	41	.180	.671
Joint	145	150		
Area of living				
Urban	96	94	.095	.758
Rural	93	97		
Participants lived with spouse				
Yes	165	169	.124	.724
No	24	22		

p<0.05 level of significance *Significant
X^2 df_1 =3.84; df_2; 5.99; df_4=9.49

The data presented in table 2 revealed that the computed P value of the baseline variable, religion ($\chi^2_{(2)}$ =6.404; P value=.041) is lesser than 0.05 level of significance, thus H_2 is accepted. Whereas the baseline variable like age ($\chi^2_{(4)}$=6.098; P value=.192), education ($\chi^2_{(4)}$=4.521; P value=. 340), Employment status ($\chi^2_{(1)}$=.038; P value=.846), Income ($\chi^2_{(4)}$=5.404; P value=.248), Obstetrical score ($\chi^2_{(1)=.}$176; P value=.675), Type of family ($\chi^2_{(1)}$=.180; P value=.671), Area of living ($\chi^2_{(1)}$=.095; P value=.758), Participants lived with spouse ($\chi^2_{(1)}$=.124; P value=.724). Hence H_2 is rejected as there is no significant association between maternal mental health status with the above mentioned baseline variables.

Section 6: Association between health practices of the participants and selected baseline Variables

Table 3: Association between health practices of the participants and selected baseline variables. n=380

Variables	Median <120 ≥ 120		χ^2Value	Chi square test P value
Age				
≤ 20	10	14		
21-25	77	74	.884	.927
26-30	71	71		
31-35	25	27		
Above 36	6	5		
Religion				
Hindu	22	47	12.551	.002*
Muslim	147	119		
Christian	20	25		
Education				
Higher primary	52	23	15.870	.003*
High school	66	76		
Higher secondary	38	43		
Degree	21	35		
Post graduate	12	14		
Marital status				
Employment status				
Home maker	168	165	.038	.846
Employed	23	24		
Income				
Below 5000	9	8		
5000-10,000	89	85	1.369	.850
10001-20,000	74	74		
20001-30,000	9	12		
30,001& above	8	12		
Obstetrical score				
Primigravida	84	91	.391	.532
Multi para	105	100		
Type of family				
Nuclear	42	43	.005	.946
Joint	147	148		
Area of living				
Urban	85	105	3.800	.051
Rural	104	86		
Living with husband				
yes	163	171	.964	.326
No	26	20		

p<0.05 level of significance *=Significant
X^2 df_1 =3.84; df_2; 5.99; df_4=9.49

The data presented in table 3 revealed that the computed P value is greater than 0.05 level of significance for most of the baseline variables except religion ($\chi^2_{(2)}$ =12.551; pvalue.002) and education ($\chi^2_{(4)}$ =15.870; p-value .003). Thus it can be stated that there is a significant association of health practices with religion and education and H_3 is accepted. The rest of the variables, age ($\chi^2_{(4)}$=.884; p value=.927) employment status ($\chi^2_{(1)}$=.038; p value=.846) income ($\chi^2_{(4)}$=1.369; p value=.850), obstetrical score ($\chi^2_{(1)}$=.391; p value=.532), type of family

($\chi^2_{(1)}$=.005; p value=.532), area of living ($\chi^2_{(1)}$=3.800; p value=.051) and living with spouse ($\chi^2_{(1)}$=.964; p value=.326) have no significant association, hence H_3 is rejected.

DISCUSSION

The present study revealed that the majority (77.1%) of the participants was young mothers belonging to the age group of 21 to 30 years and very few (2.9%) were above 36 years. Large numbers (70%) of participants were Muslims and rests of the participants were Hindus (18.2%) and Christians (11.8%). Very few (6.8%) were professionals. Most (37.4%) were high school literates. The majority (87.4%) of the participants was homemakers and the rest (12.6%) were employed. Almost less than half of the participants (45.8%) earned between Rs. 5000-10,000, 38.9% of participants earned Rs.10, 001 -20,000 and only few (4.5%) had earning below Rs.5000. Among the participants 53.9% were multipara and 46.1% were primigravida. A majority (77.6%) of participants' belonged to the joint family and the rest to the nuclear family (22.4%). The participants were equally (50%) distributed to urban and rural areas. The majority (87.9%) of participants were living with their spouse, and among the 12.1% who were not living with the spouse, 100% lived with their in-laws as their spouse was working elsewhere.

Other study findings that were consistent to the findings of the present study are revealed as the majority of the women in 36-38 weeks of gestation with the average age as 26.7 (SD 5.6) years, Muslims (64.2%) and housewives (70.2%). [6] Around 52.7% of the participants were between 26-to 30 years with a mean age of 26.4 ± 3.2 years. 40.3% had studied only till 8th standard and majority (73.1%) lived in joint families. [11] A cross-sectional study conducted in Krishna Nagar village of Miran Sahib Zone of block R.S. Pura also revealed that majority of the mothers were ≥ 26 years of age (53.6%), housewives (94.3%) and were residing in joint families. [12] These findings are also congruent to the present study results.

The present study revealed that 59.5% of women showed possible depressive symptoms, and 40.5% had no depressive symptoms.

Fifty-nine percent of the women experienced depressive symptomatology during pregnancy. [5] Eleven percent (n = 32) had scored of ≥10, indicating possible depression on EPDS score (P < 0.01) in a study conducted tertiary care Hospital, Bengaluru. [13] Among 166 women from Baltimore, Maryland revealed that 59% (n = 98) of participants had scores that were clinically significant for depressive symptoms. [14] Similar study conducted in the rural settings of Chennai found that majority of the participants (65%) had scored 13 and higher on the Edinburg Depression Scale reflecting high likelihood of depression. [15]

The present study revealed that the majority of participants (98.9 %) engaged in good health practices. The study revealed that 92.2% refrained from substance abuse, 79.8% accessed health care, 76.9% practiced intake of good nutrition and supplements, 68.8% balanced rest and exercise and 61.1% sought health information whenever necessary. The practice of safety measures was found to be satisfactory. Overall, it was found that refraining from substance abuse, proper nutrition, practice of rest & sleep and health care access were found favorable.

There are not many studies that have assessed health practices but they have taken a single variable to correlate the study. To mention a few, physical exercise in pregnancy and the development of hypertensive disorders indicated that physical activity in pregnancy may be associated with lower risk of pre-eclampsia, gestational diabetes, very low birth weight, and cesarean birth. [16] Another study conducted at three Primary Health Centers in Al-Khobar 2001 to find out the level of health awareness related to pregnancy and the sources of information revealed that a

large proportion of the women were well informed about certain health issues of pregnancy. [17] A cross-sectional descriptive study in Pondicherry revealed that 18% were practicing exercise in pregnancy. The study concluded the attitude of antenatal women was favorable. [18] Another cross-sectional study conducted in an Indian state with the aim to assess the level of knowledge of pregnant women also had favorable findings supporting the present study. [11]

There was no correlation between maternal mental health and engagement in health practices among participants. The present study findings were similar to the findings of a study that revealed strong negative correlation (r =−0.80; P < were.001) between HPQ-II and EPDS. [5]

There were not many studies that support the findings of the relationship between maternal mental health and engagement in health practices

The findings revealed that is no significant association between mental health status and baseline variable except religion. A study conducted on the prevalence of antenatal depressive symptoms among women in Sabah, Malaysia found that association with socio-demographic factors including marital status and education level towards antenatal depression was no longer significant. [6] Another cross-sectional study revealed that being educated and unemployed was significantly associated with depression. Family income was not significantly associated with depression. [12] A community-based cross-sectional study revealed that demographic variables such as age, education, and occupation were not associated with antenatal depression. [19]

The present study findings revealed the association between health practices of the participants and baseline variables such as religion and education. A cross-sectional study revealed that almost all the variables such as age, education, occupation, parity, type of family, and socioeconomic status (SES) had a significant association with awareness about ANC which is not congruent to the findings of the present study [20] whereas another study findings were similar to the findings of the present study, in which health practice not significantly associated with marital status or gravidity. [5]

Another study results were contradictory to the present findings where ANC service utilization was found to be significantly associated with age, literacy, socioeconomic status (SES), and type of family but was not significantly associated with the occupation of the mother. [11]

This study has few limitations such as it was limited to only antenatal mothers who are in the third trimester and the pilot study as well as for the main study were conducted in the same setting. Finally, the study findings were based on purposive sampling. On the basis of the findings, the following recommendations have been made for further study. A similar study can be conducted in different settings. A comparative study may be conducted between government and private hospitals for further exploration. Qualitative analysis of the health practices of women and assessing the influence of the social system on stress in antenatal women.

CONCLUSION

The findings of the study revealed that majority of the antenatal women showed possible depressive symptoms. In comparison to their mental health status, the majority of participants engaged in good health practices. Majority of the women refrained from substance abuse. There is no evident practice of the use of substances or drugs in the study setting as well as the geographical area. As antenatal care is easily accessible in the selected geographical area, most of the women have visited the antenatal clinics. There is no relationship between the mental health status of antenatal women and their health practices. It shows that though pregnancy is stressful; women looked after themselves and their unborn adequately. Mental health

status and health practices are independent of any baseline characteristics. Women engaged in good practices depending on their knowledge and attitude towards their pregnancy.

Nursing implications

The findings of the present study have brought out certain facts that have far-reaching implications in the fields of nursing education, nursing practice, nursing research and nursing administration.

Nursing Education

In the field of nursing profession, the students are prepared to meet the comprehensive needs of the patients in the areas of physical, psychological, social, emotional and spiritual care aspects. Nurse educators' can emphasis on psychological / psychiatry illness in pregnancy, enhancing the skills in using of EPDS in the assessment of depressive symptomatology and patient education on good health practices in pregnancy. In this study, the investigator prepared a leaflet on preventive measures of depressive symptoms and distributed it to the antenatal mothers in the OPD.

Nursing Practice

As a midwife she should assess depressive symptomatology during admission or at OPD, assessing women's health practices by observation during their stay in the hospital or through interview at OPD, provide adequate information to the pregnant women during antenatal period on regular antenatal check-up, balanced diet, maintenance of personal hygiene, adequate rest and sleep, performing antenatal exercise, relaxation techniques and measures to promote good emotional well-being.

Nursing Administration

The nurse administrator has a role of collaborating with other health care department other than obstetrics like psychiatric department where she can refer the mothers after screening for depressive symptoms for further management. She should introduce the screening programme to find out depressive symptoms for the antenatal mothers. Physiotherapy is another department where she can involve them to teach some specific exercise to the patients. Dietary department is most important to provide good information and proper diet to the mothers. She should also link with Government health personnel. Thus she can become the liaison between antenatal women and the health care members.

Nursing Research

The nurse researcher should acquire wide knowledge regarding the new trends in the existing health scenario. The present study is an effort to assess the effect of maternal mental health on the engagement of health practices during pregnancy. Antenatal women should be educated about the preventive measures of depressive symptoms as well as good health practices. This can be attained through health education, providing information leaflets, pamphlets and childbirth preparation classes during the antenatal period.

ACKNOWLEDGMENT

The co-operation of the management and faculty of the research program added confidence in the investigator in the successful completion of the study

REFERENCES

1. Prince M, Patel V, Saxena S, Maselk M J, Phillips M R, et al . No health without mental health: Global Mental Health 1,(internet) lancet ,Sep 8 2007;(cited Jan7th 2017); available from : http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(07)61238-0.pdf
2. Anja H C. Stress during pregnancy is associated with developmental outcome in infancy.(internet)Journal of child psychology and psychiatry,44(6)Sept 2003, (citedJan4th2016);810-818.Available from http://onlinelibrary.wiley.com/doi/10.1111/1469-7610.00166/full
3. American pregnancy association .Depression in Pregnancy: 2015(.Online) (Cited Jan 18th 2018: (1-2). Available from: http://americanpregnancy.org/pregnancy-health/depression-during-pregnancy/
4. Satyanarayana VA, Lukose A, Srinivasan K. Maternal mental health in pregnancy and child behavior. Indian J Psychiatry [serial

online] 2011 [cited 2018 Mar 5]; 53:351-61. Available from: http://www.indianjpsychiatry.org/text.asp?2011/53/4/351/91911

5. Jeanne A L, Lauren A, kelli D. Effects of Maternal Mental Health on Engagement in Favorable Health Practices During Pregnancy Midwifery Women's Health. (Internet) 2016 Mar-Apr (cited nov25th016); 61(2):210-6. doi: 10.1111/jmwh.12407. Epub 2016 Feb 5.Available from https://www.ncbi.nlm.nih.gov/pubmed/26849176
6. Mohamed Yusuff AS, Tang L, Binns CW, Lee AH.Prevalence of antenatal depressive symptoms among women in Sabah, Malaysia.The Journal of Maternal-Fetal & Neonatal Medicine. (Internet) 2016 Apr 2 ;(cited on 2018 Mar4)29(7):1170-4.Available from: http://www.ums.edu.my/fpsk/files/Lima.pdf
7. Bavle AD, Chandahalli AS, Phatak AS, Rangaiah N, Kuthandahalli SM, Nagendra PN. Antenatal depression in a tertiary care hospital. Indian Journal of PsychologicalMedicine(internet)Jan3,2017(cited2018Feb2(1):31Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4782441/
8. Silwal M, Jacob V, Imran S. A descriptive study to assess the level of anxiety and depression among antenatal mothers in a selected hospital, Mangalore, with a view to developing an information booklet. International Journal of Recent Scientific Research 2015 Aug; 6(8):5699-703. Available
9. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression: development of the 10-item Edinburgh Postnatal Depression Scale. The British journal of psychiatry.(internet) 1987 Jun;150(cited 2016 ,Dec.15)(6):782-6.Avaliable from: https://www.ncbi.nlm.nih.gov/pubmed/3651732
10. Lindgren K. Testing the health practices in pregnancy questionnaire–II. Journal of Obstetric, Gynecologic & Neonatal Nursing. [Internet] 2005 Jul 1; [cited on 2017 Oct 12); 34(4):465-72. Available from:https://www.ncbi.nlm.nih.gov/pubmed/16020414
11. Kumar N, Bhagwan D, Singh N, D'Souza M, Bhaskaran U, Thapar R, Prasanna M, Kulkarni V, Ramesh H .Risk Factors for Antenatal Depression among Women Attending Tertiary Care Hospitals in Coastal Part of South India. Natl J Community Med (internet) 2017 ;(cited18thApril2018) 8(9):517-520.
12. Gupta RK, Shora TN, Verma AK, Jan R. Knowledge regarding antenatal care services, its utilization, and delivery practices in mothers (aged 15-49 years) in a rural area of North India. Trop J Med Res [serial online] 2015 [cited 2018 April 14]; 18:89 94.Availablefrom:http://www.tjmrjournal.org/text.asp?2015/18/2/89/158401
13. Bavle AD, Chandahalli AS, Phatak AS, Rangaiah N, Kuthandahalli SM, Nagendra PN. Antenatal depression in a tertiary care hospital.Indian journal of psychological medicine. (Internet) 2016 Jan ;(cited on 2018 mar 4)38(1):31.Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4782441/
14. Alhusen JL, Gross D, Hayat MJ, Rose L, Sharps P. The role of mental health on maternal-fetal attachment in low-income women. J Obstet Gynecol Neonatal Nurs 2012 Nov-Dec; 41(6). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3473171/
15. Srinivasan N, Murthy S, Singh AK, Upadhyay V, Mohan SK, Joshi A. Assessment of burden of depression during pregnancy among pregnant women residing in rural setting of chennai. Journal of clinical and diagnostic research: JCDR. (Internet) 2015 Apr; (cited on Feb 27th 2018)9(4): Available from: https://www.ncbi.nlm.nih.gov/pubmed/26023573
16. Gambhir RS, Nirola A, Gupta T, Sekhon TS, Anand S. Oral health knowledge and awareness among pregnant women in India: A systematic review. Journal of Indian Society of Periodontology. (Internet) 2015 Nov ;(cited on 4th march 2018)19(6):612.Avaiable from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4753703/
17. Almurshed KS, Bani IA, Al-Kanhal MA, Al-Amri MA. A study of maternal dietary intake during pregnancy in Riyadh, Saudi Arabia.Journal of family & community medicine. (Internet) 2007 Jan ;(cited onMarch1st 2018)14(1):9-13. Available

from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3410119

18. Rasheed P, Al-Sowielem LS. Health education needs for pregnancy: A study among women attending primary health centres. Journal of family & community medicine. (Internet) 2003 Jan ;(cited on 2018 Mar 2)10(1):31-38 Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3425755/
19. Bisetegn TA, Mihretie G, Muche T. Prevalence and predictors of depression among pregnant women in Debretabor town, Northwest Ethiopia. PloS ONE. [Internet] 2016 Sep 12; [cited 29/4/2018] 11(9):e0161108. Available from: URL:http://journals.plos.org/plosone/article?id=10.1371/journal.pone. 0161108
20. PayghanBS, Kadam SS, Reddy RR. A Comparative Study of Nutritional Awareness among Urban-Rural Pregnant Mothers. Research & Reviews: Journal of Medical and Health Sciences. Available from http://www.rroij.com/open-access/a-comparative-study-of-nutritional-awareness-among-urbanrural-pregnant-mothers.php?aid=35014 30/08/2014

How to cite this article: Jacob S, Aranha DMS, D'souza P. To assess the effect of maternal mental health on engagement in health practices during pregnancy in selected hospital at Mangaluru. Int J Health Sci Res. 2019; 9(4):156-166.

******